Tourism Management 74 (2019) 12–23

Contents lists available at ScienceDirect

Tourism Management

journal homepage: www.elsevier.com/locate/tourman

The balance of trade and exchange rates: Theory and contemporary evidence from tourism

Tarik Dogru[a,*], Cem Isik[b], Ercan Sirakaya-Turk[c]

[a] Florida State University, Dedman School of Hospitality, Tallahassee, FL, USA
[b] Anadolu University, Faculty of Tourism, Yunus Emre Kampüsü Tepebaşı, Eskişehir, Turkey
[c] University of South Carolina, College of Hospitality, Retail & Sport Management, Columbia, SC, USA

ARTICLE INFO

Keywords:
Balance of trade
Exchange rates
J-curve theory
Theory of international trade
Tourism trade balance

ABSTRACT

The purpose of this study is to investigate the effects of exchange rate depreciations and appreciations on the tourism trade balance. Specifically, we employed linear and nonlinear autoregressive distributed lag (ARDL) cointegration techniques to analyze the extent to which currency depreciations and appreciations affect the United States (U.S.) bilateral tourism trade with Canada, Mexico, and the United Kingdom (U.K.). The results showed that the depreciation of the U.S. dollar subsequently improves the U.S. trade balance with all three trading partners. However, while the appreciation of the U.S. dollar deteriorates the U.S. bilateral tourism trade balance with Canada and the U.K., it does *not* ultimately affect the U.S. bilateral tourism trade with Mexico in the long term. These results provide evidence contradicting the J-curve theory, supporting the postulations of the ML condition. Theoretical and policy implications are discussed within the realms of J-curve theory, Marshall-Lerner (ML) condition, international trade, and tourism.

1. Introduction

The liberalization of international trade has provided companies access to additional markets beyond their own domestic marketplaces to sell and export their goods and services, an economic change that has led to substantial growth in international trade (i.e., exports and imports) in excess of $35 trillion USD in 2017 (WTO, 2018). The volume of international tourism specifically, which accounted for approximately 4% of international trade in 2017, has also increased, and is expected to grow by 5% annually (WTO, 2018). Therefore, capturing a larger share of this trade is one of the primary goals of DMOs (destination management organizations) and local tourism companies.

While international trade enhances the quality of goods and services for consumers, it also increases the competition between domestic and foreign firms (Dogru & Bulut, 2018; Isik, 2015; Isik, Dogru and Sirakaya-Turk, 2018; Song, Dwyer, Li, & Cao, 2012). In the context of international tourism, destinations, as well as domestic tourism and hospitality firms, compete with each other to attract more tourists, generate more tax revenues, and increase both tourism receipts and export figures (Dogru, Sirakaya-Turk, & Crouch, 2017; Kotler & Gertner, 2002; Patsouratis, Frangouli, & Anastasopoulos, 2005).

The competition is not limited only to tension between domestic and foreign firms: it also extends to a macroeconomic level between the U.S. government and foreign governments due to the potential consequences a trade deficit might have for a national economy in the competitive global economy (Croes, 2006; Dwyer, Forsyth, Madden, & Spurr, 2000; Madura, 2011; Russo, 2002). Thus, free international trade has long been a major concern for the policymakers of national economies. Although countries may have a balance of trade surplus within their overall economy or certain industries, such as the automotive, construction, or tourism industries, they may also have a balance of trade deficit between their trading partners, which can be disadvantageous in the competitive global economy. Carrying a balance of trade deficit may not necessarily be financially damaging; however, it needs to be controlled by the country's internal systems of government to protect national economic interests (Madura, 2011). Otherwise, according to the tenets of international trade theory, a large balance of trade deficit may result in shifting jobs to foreign countries (Dixit & Norman, 1980; Jones, 1967; Madura, 2011); in other words, higher demand for imports than for locally produced goods will lower the production output and adversely affect employment. Due to low demand for domestic goods, the demand for employment will also weaken, and jobs would likely shift to foreign countries. Therefore, managing the balance of trade is a critical responsibility for policymakers.

To reduce or correct deficits in balances of trade, governments can

* Corresponding author.
E-mail addresses: tdogru@dedman.fsu.edu (T. Dogru), isikc@anadolu.edu.tr (C. Isik), ercan@hrsm.sc.edu (E. Sirakaya-Turk).

https://doi.org/10.1016/j.tourman.2019.01.014
Received 16 August 2018; Received in revised form 14 January 2019; Accepted 15 January 2019

implement a number of policies. Imposing tariffs and quotas on imported goods, providing subsidies to exporting firms, and devaluing or depreciating the local currency against the other currencies are a few policy tools that could affect the balance of trade (Bahmani-Oskooee & Ratha, 2004; Dixit & Norman, 1980; Eichengreen, 1981; Madura, 2011). Import tariffs, a recent controversial issue of public debate in the U.S., are expected to increase prices of imported goods. Consequently, the demand for products and services that are subject to trade is expected to decrease (Lerner, 1946; Obstfeld, Rogoff, & Wren-lewis, 1996).

Although a decreased consumption of foreign goods is the desired outcome of these import tariffs as a protectionist economic policy tool, it may also have adverse consequences for a country's national economy. The local currency becomes more expensive as a result of reduced demand for foreign currencies (Dixit & Norman, 1980; Madura, 2011). More specifically, the local currency appreciates against other currencies, making the domestic products and services relatively more expensive abroad. According to the Lerner symmetry theorem (Lerner, 1946), restrictions on imports through tariffs and quotas, coupled with export subsidies, are expected to control the fluctuations in exchange rates. However, imposing tariffs on imports may have undesired outcomes for the global economy as well; countries might retaliate to such tariffs by imposing their own tariffs on imported products. Tariffs and quotas could lead to increases in the prices of goods and services across the globe, which can lead to slower economic growth, higher inflation and interest rates, and higher unemployment due to reduced production (Dixit & Norman, 1980; Jones, 1967; Madura, 2011). As a matter of fact, imposing tariffs might cause trade wars between countries, and the resulting macroeconomic effects could be detrimental for the global economy.

Instead of strict restrictions like tariffs and quotas, exchange rates could be used as an economic policy tool to manage and correct the balance of trade deficits (Bahmani-Oskooee & Hegerty, 2010; Eichengreen, 1981; Madura, 2011). Already, exchange rates have become a major economic policy tool for governments in international trade and to manage the balance of trade. The so-called Marshall-Lerner (ML) condition, based on Marshall's theory of the price elasticity of demand (Marshall, 1923) by Alfred Marshall and Abba Lerner, suggests that a country could improve its balance of trade in the long run via the strategic deprecation of its currency (Alexander, 1952; Bahmani-Oskooee, 1985; Branson, 1972; Marshall, 1923). Imports become more expensive due to the change in relative prices following depreciation, so the demand for them decreases; since exports become less expensive, their demand increases.

However, Magee (1973) argued that there is an adjustment process between depreciation and changes in the behavior of all economic stakeholders (e.g., consumers, importers, and exporters); thus, the balance of trade initially deteriorates immediately following depreciation. At the time of depreciation of a local currency, both importers and exporters have already signed their contract at previously determined prices and quantities, which makes the demand inelastic (Bahmani-Oskooee & Ratha, 2004; Magee, 1973). Because of this delayed feedback, imports become relatively more expensive in local currency immediately after depreciation, while the prices of exports do not change. Thus, the balance of trade deteriorates following the depreciation of the local currency (Magee, 1973). Eventually, exporters and importers will enter into new agreements, taking the consumer demand for exports and imports into account; imports will become more expensive, causing the demand to decline, while the exports become cheaper as demand for them increases (Bahmani-Oskooee, Halicioglu, & Hegerty, 2016; Dixit & Norman, 1980).

Accordingly, the combined effects of devaluation or depreciation on the balance of trade in the short and long run forms what is called the skewed J-curve, widely known as the J-curve theory or hypothesis in the international trade literature (Bahmani-Oskooee, 1985; Bahmani-Oskooee & Fariditavana, 2016; Madura, 2011; Magee, 1973; Rose & Yellen, 1989). Per the J-curve theory, currency depreciation initially

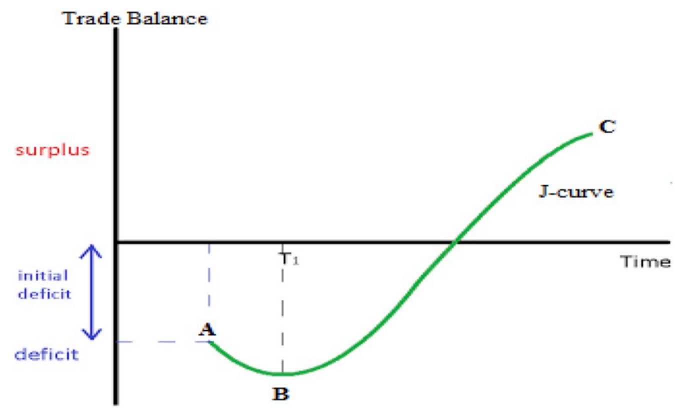


Fig. 1. J-curve.

leads to an increase in spending on imports due to the fact that locals have to pay more in their local currency to purchase the imports at prices initially set in foreign currency (Bahmani-Oskooee & Fariditavana, 2016; Rose & Yellen, 1989). Unfavorably, the prices of exports become less expensive immediately following a currency depreciation because local firms are paid relatively less at the initially set prices. While the balance of trade initially worsens due to currency depreciation, it eventually improves and surpasses its status prior to the currency depreciation, because the local demand for imported products will decrease, whereas demand for exports will increase (see Fig. 1).

In the context of international tourism, a depreciation in local currency against other currencies is expected to lead to an ultimate decrease in outbound tourism, since tourism in international destinations becomes more expensive (Chi, 2015; Crouch, 1996; Dogru et al., 2017; Song & Li, 2008; Uysal & Crompton, 1985; Vogt, 2008). However, outbound tourists from a country in which the local currency has depreciated will end up spending more because they have already made their travel arrangements. At the same time, inbound tourists visiting a country in which the local currency has depreciated will spend less, so the country's tourism balance of trade will deteriorate immediately following depreciation. Eventually, the outbound tourism demand from a country in which the local currency has depreciated will decline, while inbound tourism to the country will increase, ultimately improving the balance of trade (Cheng, Kim, & Thompson, 2013; Chi, 2015; Dogru & Sirakaya-Turk, 2016; Song et al., 2012).

While the postulations of the J-curve theory have long been examined within different sets of countries by utilizing a variety of empirical techniques, previous studies have reported mixed results. Studies of Magee (1973), Brissimis and Leventakis (1989), and Bahmani-Oskooee and Fariditavana (2016) found evidence in support of the J-curve formation. Conversely, studies of Rose and Yellen (1989), Bahmani-Oskooee, Economidou, and Goswami (2006), and Bahmani-Oskooee et al. (2016) have presented some findings that contradict the J-curve theory. Furthermore, the extent and magnitude of the effect of exchange rate depreciations and appreciations on tourism trade balances have yet to be examined.

Within the United States, studies by Vogt (2008), Cheng et al. (2013), and Chi (2015) examined the effect of exchange rates on the U.S. tourism trade balance and found evidence contradicting the J-curve theory. However, these previous studies analyzed the relationship by (1) utilizing aggregate-level data, (2) using static econometric approaches, and (3) assuming that the relationship between the exchange rate and balance of trade is symmetric or linear. All of these approaches have caveats associated with them. First, the results from aggregate-level data might not be used to elicit bilateral trade policies. Second, static analyses assume that the economic data is fixed, which is very unlikely because the variance and covariance of economics data change over time. As a result, coefficient estimates may not be BLUE (best, linear, and unbiased estimator). Third, assuming a linear relationship between the exchange rate and balance of trade might be less than perfect. Currency depreciations might have different impacts on tourism trade balances than would appreciations, for example. Therefore, the extent to which exchange rate depreciations and appreciations affect tourism trade balances is not clear.

Accordingly, the purpose of this study is to investigate the effects of exchange rate depreciations and appreciations on the tourism balance of trade. To do so, we analyzed the U.S. bilateral tourism trade balances with Canada, Mexico, and the United Kingdom utilizing the nonlinear autoregressive distributed lag ARDL cointegration and error-correction techniques. In so doing, this study examines the relationship between the exchange rates and the balance of trade by rectifying the limitations of previous studies. First, we tested the J-curve theory using disaggregate data (i.e., at the country level), which provides policy implications at a bilateral tourism trade level. Second, we utilized a dynamic econometrical approach in our analyses, which yields unbiased and reliable statistical estimates. Third, we do not assume a symmetrical relationship between the exchange rate and tourism trade. Overall, the results are expected to contribute to tourism economics literature by offering recommendations to policymakers and other stakeholders about how to model exchange rate policies to better manage tourism trade balances.

2. Literature review

The nexus between the exchange rate and balance of trade has been extensively examined in economics literature (see e.g., Bahmani-Oskooee, 1985; Bahmani-Oskooee et al., 2006; Bahmani-Oskooee et al., 2016; Bahmani-Oskooee & Ratha, 2004; Brissimis & Leventakis, 1989; Eichengreen, 1981; Rose & Yellen, 1989). The central area that researchers seek to address is the extent to which depreciations and appreciations of local currency against other currencies affect countries' balances of trade. The extant studies have empirically investigated the relationship between exchange rates and balance of trade within the context of the well-known Marshall-Lerner (ML) condition and the J-curve theory. Marshall and Lerner developed their proposition based on Marshall's preexisting theory of the price elasticity of demand, which states that the depreciation of local currency would eventually benefit the balance of trade if the sum of the demand elasticities of imports and exports surpassed unity (Alexander, 1952; Bahmani-Oskooee, 1985; Branson, 1972; Marshall, 1923).

Studies have also shown, however, that depreciation of a local currency could have immediate adverse effects on the balance of trade due to the time lag between existing and new contracts. Magee (1973) argued that the balance of trade worsens directly following a depreciation because there is an adjustment process between depreciation and change in consumers', importers', and exporters' behaviors. At the time of a depreciation of a local currency, both importers and exporters will have already signed their contracts at previously determined prices and quantities, which makes the demand inelastic. Accordingly, imports instantaneously become more expensive in local currency with the depreciation, while the prices of exports do not change in terms of the local currency. Thus, the balance of trade worsens following the depreciation of the local currency, which is referred to as the exchange rate pass-through in the international trade literature (Bahmani-Oskooee & Ratha, 2004; Madura, 2011; Magee, 1973). Over time, imports will end up more expensive and the demand will decline, while exports become relatively cheaper and the demand for exports would likely increase. Both the immediate and eventual effects of depreciation will create a skewed J-curve on the balance of trade (Dixit & Norman, 1980; Magee, 1973). This is known as the J-curve theory or hypothesis. The figure below presents the formation of a J-curve according to the J-curve theory.

The following phases summarize the formation process of the skewed J-curve:

Phase 1: Country *t*'s currency depreciates (i.e., its value declines as compared to the country *i*'s currency)
Phase 2: Depreciated currency leads to an increase in the prices of imports in country *t*'s local currency, whereas prices of exports do not change, thus worsening the country *t*'s balance of trade.
Phase 3: The exports of country *t*, in which the currency has depreciated, increase as the demand for products and services increases, due to relatively competitive prices. The imports into the country *t* decrease as the demand for domestic goods and services increases due to price discrepancies.
Phase 4: The country *t*'s balance of trade eventually improves and surpasses the previous peak point, forming a J-curve.

Magee (1973) tested the ML condition in the context of the U.S. and found evidence contradicting some of its principles. Instead, findings from Magee (1973) showed that U.S. balance of trade initially deteriorates and eventually improves, forming a skewed J-curve as described above. In a different study, while investigating the effect of currency devaluation in 13 developed countries including the U.S., U.K., and Canada, Junz and Rhomberg (1973) found complementary evidence supporting the postulations of Magee (1973) and the J-curve theory. Nonetheless, the empirical approach used in the studies of Magee (1973) and Junz and Rhomberg (1973) has been criticized by Miles (1979) on the grounds that these studies omit other critical influential factors, such as monetary policy and economic growth rates. Bahmani-Oskooee (1985) developed an alternative empirical approach to test whether the process of J-curve formation occurs as suggested by the theory, and analyzed the effect of devaluation on the trade balances of Greece, India, Korea, and Thailand by controlling for domestic and foreign income levels and money supplies. The empirical results supported the J-curve theory, suggesting that countries' trade balances initially weaken but ultimately expand following currency depreciation.

Although researchers have utilized a variety of empirical techniques (for an extensive review of the literature on the J-curve theory, see Bahmani-Oskooee and Ratha (2004) and Bahmani-Oskooee and Hegerty (2010)), earlier studies did not take into consideration the dynamic nature of exchange rate policies, and they also tended to apply ordinary least square (OLS) techniques to analyze the effect of depreciation on balance of trade. However, OLS techniques could yield spurious findings due to potential autocorrelation and the non-stationarity of the data (Wooldridge, 2010). Since then, significant developments have been made in empirical modeling to estimate the effects of currency depreciation on balance of trade.

Beginning with Rose and Yellen (1989), alternative dynamic modeling techniques have been utilized to examine the effect of currency depreciation on balances of trade to prevent spurious estimation problems that are usually due to the non-stationarity of economics datasets. Rose and Yellen (1989) examined the effect of depreciation on bilateral trade balances between the U.S. and six of its trading partners, applying both cointegration and error correction models. However, their findings showed that the exchange rate has no effect on the bilateral balance of trade between the U.S. and these six particular trading partners, thus contradicting the postulations of the J-curve theory. Adopting a similar empirical approach, Brissimis and Leventakis (1989) reported results that indicated the formation of a skewed J-curve in Greece's balance of trade.

Researchers have further analyzed the relationship between the exchange rate and balance of trade by employing a variety of contemporary empirical techniques in similar and different country contexts. However, these studies also reported mixed results. Studies of Narayan and Narayan (2004), Bahmani-Oskooee and Kovyryalova (2008), and Bahmani-Oskooee and Fariditavana (2016), for example, found evidence supporting the presence of a J-curve pattern. Yet, the results from the studies of Arora, Bahmani-Oskooee, and Goswami (2003), Bahmani-Oskooee and Ratha (2004), and Bahmani-Oskooee et al. (2006) yielded contradictory findings.

Bahmani-Oskooee and Fariditavana (2015) postulated that the empirical methodologies employed to analyze the relationship between the exchange rate and balance of trade assume a symmetric relationship between the exchange rate and balance of trade. However, it stands to reason that currency depreciation might have different impacts on balance of trade than appreciation. In their more recent study, Bahmani-Oskooee and Fariditavana (2016) replicated the study of Rose and Yellen (1989) utilizing the nonlinear ARDL cointegration approach and found evidence of a J-curve pattern, contrary to the previous findings. These results suggest that assuming a symmetric relationship between the exchange rate and balance of trade may yield imperfect data analyses. In a similar study, Bahmani-Oskooee et al. (2016) analyzed the effect of exchange rates on bilateral balance of trade between Mexico and six of its trading partners utilizing the nonlinear ARDL model and found that appreciation of the peso deteriorated the trade balance of Mexico with the U.S. and Canada, whereas depreciation of the peso improved the trade balance of Mexico with all of these six trading partners.

It has also been suggested that these conflicting analyses could be contingent on the bilateral trade agreements. Bahmani-Oskooee and Brooks (1999) argued that the conflicting results could be due to investigation of the relationship between exchange rates and balance of trade at an aggregate level, rather than at a bilateral trade level between individual countries. Analyzing the relationship between exchange rates and balance of trade at a country level may still be flawed, however, because the effect of depreciation could be different at the industry level. For instance, depreciation in exchange rates might affect the bilateral trade balance of the automotive industry at a different level than it does the tourism industry. Bahmani-Oskooee and Hegerty (2011) analyzed the relationship between the exchange rate and the bilateral trade balance of Mexico and the U.S. at different industry levels and found evidence supporting the postulations of the J-curve theory in some industries but not in others. It is worth noting that the tourism industry was not a part of the sample that Bahmani-Oskooee and Hegerty (2011) used.

Although the effect of exchange rate on tourism demand has been widely investigated in tourism economics literature (see e.g., Crouch, 1994; De Vita & Kyaw, 2013; Dogru et al., 2017; Martins, Gan & Lopes, 2017; Song & Li, 2008; Uysal & Crompton, 1984), the relationship between exchange rate and bilateral tourism trade balances has received scant attention from tourism scholars, despite the essential implications of exchange rate on international tourism. Within the context of international trade, Vogt (2008) examined the effect of exchange rate on tourism trade balances at the aggregate level (U.S. versus other countries). While evidence of a J-curve pattern was not reported, the results showed that outbound tourism is more sensitive to exchange rates than inbound tourism. Employing an alternative empirical approach and using quarterly data, Cheng et al. (2013) also analyzed the relationship between the exchange rate and U.S. tourism trade balance at the aggregate level. Their results were similar to those of the Vogt (2008) study. More recently, Chi (2015) tested the J-curve theory in the context of the U.S. tourism trade balance utilizing the cointegration empirical technique. While the findings of Chi (2015) did not provide support for the J-curve theory, the results showed that depreciation of the U.S. dollar improves the U.S. tourism trade balance.

As this review of literature that has studied the relationship between the bilateral exchange rates and tourism balances illustrates, there are several notable gaps in our knowledge about this important and timely topic. First, Vogt (2008) used a static empirical technique to investigate the effect of exchange rate on the tourism trade balance. However, static models do not take the dynamic nature of most economics datasets into account and therefore may yield spurious results. Second, in the context of tourism, former studies used aggregate-level data to test the postulations of the J-curve theory. The relationship between exchange rates and trade balance at only the aggregate level cannot reveal the specific effect of depreciation on bilateral trade balances. Furthermore, the imprecise results from aggregate-level analyses may not produce proper policy implications for given country sets. Countries might also have different political and economic relationships between each other, meaning that depreciations of a local currency might interact differently with other countries' currencies. Currency depreciations on bilateral trade balances might also influence the tourism industry differently than it would other industries. Third, Bahmani-Oskooee and Fariditavana (2015) argued that assuming a symmetric relationship between the exchange rate and balance of trade might yield biased estimates because depreciation might have different impacts on balance of trade than does appreciation. Thus, the nature of the relationship between the exchange rate and balance of trade should be tested prior to applying linear empirical techniques. By applying a nonlinear empirical methodology to analyze the relationship between bilateral exchange rates and tourism trade balances, we expect that the current study will begin to address these voids.

3. Methodology

3.1. Model

The findings of Magee (1973), Bahmani-Oskooee (1985), Rose and Yellen (1989), Brissimis and Leventakis (1989), Bahmani-Oskooee and Brooks (1999), Bahmani-Oskooee and Ratha (2004), Narayan and Narayan (2004), Bahmani-Oskooee and Hegerty (2010), and Bahmani-Oskooee and Fariditavana (2016) helped to constitute the theoretical foundation of our study, as they all essentially focus on the association between exchange rates and trade balances. In this model, trade balance is a function of bilateral exchange rate between two trading countries and both countries' incomes. We model the U.S. tourism trade balance as a function of the bilateral exchange rate between the U.S., Canada, Mexico, and the U.K., and their respective income levels. Specifically, the model can be defined as

$$TOB_{it} = f\,(EXC_{it},\ I_{it}) \tag{1}$$

where *TOB* is defined as the rate of outbound tourist departures from the USA to its tourism partner country i divided by the inbound tourist arrivals to the USA from the same country., *EXC* is the bilateral exchange rate between the USD and trading partner country i's currency, I_i is the U.S. Industrial Production Indexes (IPI) (as proxy of income), and its trading partner country i's Industrial Production Indexes (IPI) (as proxy of income).

3.2. Sample and data

The U.S. tourism trade balance is measured by the rate of outbound tourist departures from the U.S. to the three study trading partners, divided by the inbound tourist arrivals to the U.S. from these countries. Table 1 presents the bilateral tourism arrivals statistics between the U.S.–Canada, the U.S.–Mexico, and the U.S.–U.K. country pairs, along with the respective tourism balances between the pairs.

The exchange rate variable refers to the real bilateral exchange rate between the U.S. and Canada's, Mexico's, and the U.K.'s currencies. In the case of Mexico, for instance, one U.S. dollar is converted to its amount in Mexican pesos in our dataset to analyze the effect of exchange rate depreciations and appreciations on the U.S. tourism trade balance. The monthly data covers the1 period from January 1996–June 2017 and hence in each country pair sample there are 258 observations. The year 1996 was chosen as the beginning of our sample period for two reasons. First, data for the countries included in the sample of this study were collectively only available from January 1996. Second, and most importantly, Mexico's central bank made a major policy change by switching to a freely floating exchange rate system in December 1994 (Madura, 2011). Thus, including the period prior to 1996 would yield inconsistent and biased estimates, since the U.S., Canada, and the U.K.

Table 1
Arrivals data (Million).

Year	CAN-USA	USA-CAN	TOURISM BALANCE USA-CAN	UK-USA	USA-UK	TOURISM BALANCE USA-UK	MEX-USA	USA-MEX	TOURISM BALANCE USA-MEX
2017	19.732	14.254	5.478	4.769	3.215	1.554	19.152	32.361	−13.209
2016	19.301	13.895	5.406	4.573	3.197	1.376	18.731	31.194	−12.463
2015	20.704	12.669	8.035	4.901	2.885	2.016	18.413	28.733	−10.320
2014	23.003	11.523	11.480	4.149	2.832	1.317	17.069	25.882	−8.813
2013	23.387	11.478	11.909	3.835	2.640	1.195	14.342	20.851	−6.653
2012	22.699	11.887	10.812	3.763	2.537	1.226	14.198	20.308	−6.110
2011	21.028	11.597	9.431	3.835	2.405	1.430	13.414	20.589	−7.175
2010	19.959	11.871	8.088	3.851	2.366	1.485	13.422	20.683	−7.261
2009	17.964	11.667	6.297	3.899	2.727	1.172	13.164	20.162	−6.998
2008	18.910	12.504	6.406	4.564	2.894	1.670	13.686	20.360	−6.674

Note: This data presents the tourism balances for the most recent years on annual basis. Monthly data covering the period of January 1996–June 2017 was used in empirical analyses.

all previously adopted a freely floating exchange rate system.

The U.S. tourism trade balance data was obtained from the National Travel and Tourism Office. The Industrial Production Index, which is used as a proxy for income in the absence of monthly gross domestic product data, was obtained from the Federal Reserve Bank of St. Louis. The nominal exchange rates and consumer price indices were also obtained from the database of the Federal Reserve Bank of St. Louis. Accordingly, the sample of this study consists of 774 country–month observations.

The motivations for choosing the U.S. to examine the effect of exchange rates on the bilateral tourism trade balances with Canada, Mexico, and the U.K. are numerous. First, the U.S. dollar is the dominant currency in the international trade marketplace. Second, Canada, Mexico, and the U.S. are part of the North American Free Trade Agreement (NAFTA), which is expected to increase bilateral trade between these countries. Third, the U.S. is one of the most developed countries in the world alongside Canada and the U.K. Also, despite economic differences, the U.S. is a major tourist destination for Canadian, Mexican, and British tourists. Furthermore, former studies examined the effect of exchange rate depreciations on the U.S. tourism trade balance at an aggregate level (see e.g., Bahmani-Oskooee & Brooks, 1999; Cheng et al., 2013; Chi, 2015; Junz & Rhomberg, 1973). Therefore, analyzing these effects at a disaggregate level in the context of the U.S. allows us to compare our findings with those of previous studies.

3.3. Empirical methodology

The stationarity of the variables needed to be tested prior to the main functions of the study to analyze the effect of exchange rate on tourism balances. In this context, we employed the Augmented Dickey–Fuller (ADF), Phillips-Perron, and Zivot Andrews unit root tests to determine the stationarity levels of the series included in our analyses. Test results showed that the series are stationary at I(1) levels at a 5% significance level. The results from the unit root tests are presented on Table 2.

While there are several empirical models that can be employed to analyze this relationship when the variables are not stationary at level I (0), cointegration relationships between variables need to be examined when the variables are not stationary in levels I(0), because a spurious regression problem may occur if regression models like ordinary least squares (OLS) are employed. Since the series in our sample are stationary at I(1) levels, we can employ both linear and nonlinear ARDL cointegration and error-correction models (ECM) to examine the effect of exchange rate on the U.S. tourism trade balances. Applying both the linear and nonlinear ARDL cointegration and error-correction methods allows us to more fully and accurately test the nature of the relationship between the exchange rate and tourism trade balances, which could be symmetric or asymmetric. The following estimation model, which was developed by Pesaran, Shin, and Smith (2001), was used to estimate the linear relationship between the exchange rate and tourism trade balance.

$$TOB_{i,t} = \beta_0 + \beta_1 I_{USA,t} + \beta_2 I_{i,t} + \beta_3 EXC_{i,t} + \varepsilon_t \tag{2}$$

The logarithmic form of Equation (2) is presented as follows.

$$lnTOB_{i,t} = \beta_0 + \beta_1 lnI_{USA,t} + \beta_2 lnI_{i,t} + \beta_3 lnEXC_{i,t} + \varepsilon_t \tag{3}$$

where $lnTOB_{i,t}$ is the rate of outbound tourist departures from the U.S. to the tourism partner country *i* at time *t*, divided by the inbound tourist arrivals to the U.S. from the same country; $lnI_{USA,t}$ and $lnI_{i,t}$ are the incomes of the U.S. and its trading partner country *i* at time *t*; and $lnEXC_{i,t}$ is the bilateral real exchange rate between the U.S. dollar and its trading partner country *i*'s currency at time *t*, which is adjusted by the respective consumer price indexes of the U.S. and its trading partners. While GDP deflator has been utilized in some tourism demand studies (see e.g., Martins, Gan, & Ferreira-Lopes, 2017), majority of the tourism demand studies utilize the CPI to adjust respective exchange rates (see e.g., Dogru et al., 2017.

The correlation coefficients for these country pairs are close to 1 (0.99911), suggesting a robust measure of bilateral exchange rate. The lnI_{USA} and lnI_i are the USA's and its trading partner country i's Industrial Production Indexes (IPI) (as proxy of income).$lnEXC_i$ is the bilateral real exchange rate between the USD and her trading partner country i's currency.

$\ln EXC_i$ = (CPIUSA*NEXi/CPI_i), where NEX_i is the nominal exchange rate defined as the number of units of partner i's currency per USD. CPIUSA and CPI_i are the Consumer Price Indexes of the USA and its trading partner country i.

We used the nonlinear ARDL cointegration and error-correction methodologies developed by Shin, Yu, and Greenwood-Nimmo (2014, pp. 281–314) to examine the nonlinear relationship between the exchange rate and tourism trade balance. The empirical specification of this model has been adapted from the studies of Bahmani-Oskooee and Fariditavana (2016) and Bahmani-Oskooee et al. (2016). The model is specified as follows.

$$\Delta lnTOB_t = \alpha + \sum_{j=1}^{n} \beta_j \Delta lnTOB_{t-j} + \sum_{j=0}^{n} \gamma_j \Delta lnI^{US}_{t-j} + \sum_{j=0}^{n} \delta_j \Delta lnI^{i}_{t-j} + \sum_{j=0}^{n} \mu_j \Delta lnEXC_{t-j} + \theta_1 lnTOB_{t-1} + \theta_2 lnI^{US}_{t-1} + \theta_3 lnI^{i}_{t-1} + \theta_4 lnEXC_{t-1} + \varepsilon_t \tag{4}$$

where short- (μ_1) and long-run (θ_4) coefficients in *EXC* denote depreciations (*NEG*ative) and appreciations (*POS*itive), respectively. Thus, equation (4) can be written in the following form.

Table 2
Augmented Dickey–Fuller (ADF) and Phillips-Perron (PP) Unit root test results.

ADF(CANADA)			PP (CANADA)		
Variables	Intercept	Intercept and trend	Variables	Intercept	Intercept and trend
$LNTB_{CAN}$	−1.001(12)	−1.686(12)	$LNTB_{CAN}$	−0.986(12)	−1.721(12)
LNY_{CAN}	−2.57(0)*	−2.15(0)	LNY_{CAN}	−2.61(0)*	−2.16(0)
LNY_{USA}	−2.62(4)	−3.04(4)	LNY_{USA}	−2.64(4)	−3.01(4)
$LNREX_{CAN}$	−1.40(1)	−1.42(1)	$LNREX_{CAN}$	−1.43(1)	−1.44(1)
$\Delta LNTB_{CAN}$	−2.92(12)**	−2.89(12)	$\Delta LNTB_{CAN}$	−2.93(12)**	−2.87(12)
ΔLNY_{CAN}	−6.88(2)***	−7.05(2)***	ΔLNY_{CAN}	−6.90(2)***	−7.03(2)***
ΔLNY_{USA}	−4.00(3)***	−4.12(3)***	ΔLNY_{USA}	−3.98(3)***	−4.14(3)***
ΔREXCAN	−11.66(0)***	−11.66(0)***	ΔREX_{CAN}	−11.68(0)***	−11.72 (0)***
ADF(MEXICA)			***PP (MEXICA)***		
Variables	Intercept	Intercept and trend	*Variables*	Intercept	Intercept and trend
$LNTB_{MEX}$	−2.13(12)	−2.17(12)	$LNTB_{MEX}$	−2.11(12)	−2.19(12)
LNY_{MEX}	−2.89(0)	−3.18(0)*	LNY_{MEX}	−2.87(0)	−3.21(0)*
LNY_{USA}	−2.62(4)	−3.04(4)	LNY_{USA}	−2.64(4)	−3.01(4)
$LNREX_{MEX}$	2.011(2)	−2.10(2)	$LNREX_{MEX}$	2.03(2)	−2.08(2)
$\Delta LNTB_{MEX}$	−4.50(12)***	−4.57 (12)***	$\Delta LNTB_{MEX}$	−4.52(12)***	−4.55 (12)***
ΔLNY_{MEX}	−5.89(3)***	−17.91(0)***	ΔLNY_{MEX}	−5.91(3)***	−17.89(0)***
ΔLNY_{USA}	−4.00(3)***	−4.12(3)***	ΔLNY_{USA}	−3.98(3)***	−4.14(3)***
ΔREX_{MEX}	−11.38(1)***	−11.74(1)***	ΔREX_{MEX}	−11.41(1)***	−11.74(1)***
ADF(UK)			***PP (UK)***		
Variables	Intercept	Intercept and trend	*Variables*	Intercept	Intercept and trend
$LNTB_{UK}$	−2.07(12)	−2.11(12)	$LNTB_{UK}$	−2.05(12)	−2.13(12)
LNY_{UK}	−2.72(0)	−3.12(0)*	LNY_{UK}	−2.70(0)	−3.15(0)*
LNY_{USA}	−2.62(4)	−3.04(4)	LNY_{USA}	−2.64(4)	−3.01(4)
$LNREX_{UK}$	2.021(2)	−2.09(2)	$LNREX_{UK}$	2.01(2)	−2.11(2)
$\Delta LNTB_{UK}$	−4.42(12)***	−4.49 (12)***	$\Delta LNTB_{UK}$	−4.44(12)***	−4.51 (12)***
ΔLNY_{UK}	−5.77(3)***	−17.86(0)***	ΔLNY_{UK}	−5.78(3)***	−17.88(0)***
ΔLNY_{USA}	−4.00(3)***	−4.12(3)***	ΔLNY_{USA}	−3.98(3)***	−4.14(3)***
ΔREX_{UK}	−11.38(1)***	−11.74(1)***	ΔREX_{UK}	−11.40(1)***	−11.74(1)***
Critical Values	%1: −3.45	%1: −3.99	*Critical Values*	%1: −3.45	%1: −3.99
	%5: −2.87	%5: −3.42		%5: −2.87	%5: −3.42
	%10–2.57	%10: 3.13		%10–2.57	%10: 3.13

Zivot-Andrews (1992)-(CANADA)				
Variables	Intercept	Break Point	Intercept and trend	Break Point
$LNTB_{CAN}$	−2.92(12)	2006:06	−2.52(12)	2013:07
LNY_{CAN}	−3.94(3)	2008:08	−3.89(3)	2008:08
LNY_{USA}	−5.60(5)***	2008:08	−5.58(5)***	2008:08
$LNREX_{CAN}$	−2.81(1)	2004:06	−3.29(1)	2009:04
$\Delta LNTB_{CAN}$	−5.83(11)***	2013:04	−6.63(11)***	2012:09
ΔLNY_{CAN}	−8.22(2)***	2009:09	−8.15(2)***	2009:09
ΔLNY_{USA}	–	–	–	–
ΔREX_{CAN}	−11.99(0)***	2002:02	−11.82(0)***	2002:02
Zivot-Andrews (1992)-(MEXICA)				
Variables	Intercept	Break Point	Intercept and trend	Break Point
$LNTB_{MEX}$	−6.02(12)***	2010:01	−6.91(12)***	2010:01
LNY_{MEX}	−5.11(6)***	2008:03	−4.88	2008:03
LNY_{USA}	−5.60(5)***	2008:08	−5.58(5)***	2008:08
$LNREX_{MEX}$	−3.49(2)	2012:12	−3.52(2)	2012:12
$\Delta LNTB_{MEX}$	–	–	–	–
ΔLNY_{MEX}	–	–	−6.86(3)***	2009:007
ΔLNY_{USA}	–	–	–	–
ΔREX_{MEX}	−12.12(1)***	2009:03	−12.42(1)***	2009:04
Zivot-Andrews (1992)-(UK)				
Variables	Intercept	Break Point	Intercept and trend	Break Point
$LNTB_{UK}$	−5.54(12)***	2008:03	−6.88(12)***	2008:03
LNY_{UK}	−5.03(6)***	2010:06	−4.81	2010:06
LNY_{USA}	−5.60(5)***	2008:08	−5.58(5)***	2008:08
$LNREX_{UK}$	−3.42(2)	2013:12	−3.54(2)	2013:12

(*continued on next page*)

Table 2 (*continued*)

Zivot-Andrews (1992)-(CANADA)				
Variables	Intercept	Break Point	Intercept and trend	Break Point
$\Delta LNTB_{UK}$	–	–	–	–
ΔLNY_{UK}	–	–	−6.84(3)***	2010:006
ΔLNY_{USA}	–	–	–	–
ΔREX_{UK}	−12.08(1)***	2009:03	−12.33(1)***	2012:03
Critical Values	%1: −5.34		%1: −5.57	
	%5: −4.93		%5: −5.08	
	%10: 4.58		%10: 4.82	

Lag lenghts are selected by Schwarz Info Criterian, *ADF* augmented Dickey-Fuller, and *PP* Phillips-Perron.

$$\Delta lnTOB_t = \alpha + \sum_{j=1}^{n} \beta_j \Delta lnTOB_{t-j} + \sum_{j=0}^{n} \gamma_j \Delta lnI_{t-j}^{US} + \sum_{j=0}^{n} \delta_j \Delta lnI_{t-j}^{i} + \sum_{j=0}^{n} \mu_j^{+} \Delta POS_{t-j} + \sum_{j=0}^{n} \mu_j^{-} \Delta NEG_{t-j} + \theta_1 lnTOB_{t-1} + \theta_2 lnI_{t-1}^{US} + \theta_3 lnI_{t-1}^{i} + \theta_4^{+} POS_{t-1} + \theta_4^{-} NEG_{t-1} + \varepsilon_t \quad (5)$$

where

$$POS = \Delta lnEXC_j^{+} = \sum_{j=1}^{n} \Delta lnEXC_j^{+} = \sum_{j=1}^{n} \max(\Delta lnEXC_j, 0) \quad (6)$$

$$NEG = \Delta lnEXC_j^{-} = \sum_{j=1}^{n} \Delta lnEXC_j^{-} = \sum_{j=1}^{n} \min(\Delta lnEXC_j, 0) \quad (7)$$

specified to capture the effects of positive and negative changes in the US dollar on tourism trade balance. Positive coefficients of the short- ($\mu_j^{-}\Delta NEG$) and long-run ($\theta_4^{-}NEG$) indicate improvement of the US tourism trade balance following the currency depreciations, whereas positive coefficients of the short- ($\mu_j^{+}\Delta POS$) and long-run ($\theta_4^{+}POS$) indicate deterioration of the US tourism trade balance following the currency appreciations.

The ARDL model allows the examination of the both long- and short-run relationship between exchange rate and tourism balances. We first test whether there is a long-run relationship between the exchange rate and tourism balances, which is reported on Tables 3 and 4. The F test, which is based on the studies of Shin et al. (2014) and Pesaran et al. (2001), shows whether the dependent and independent variables are jointly cointegrated (i.e., there is a long-term relationship between the exchange rate and tourism balances). A statistically significant F test suggests that the exchange rate and tourism balances are cointegrated, supporting the long-run relationship between exchange rate and tourism balances. We also examine whether the J-curve effect exist. For this purpose, testing the short-run effect of exchange rate on tourism balances employing an error-correction model (ECM) is necessary. The "ECM_{t-1}" shows the short-run effect of exchange rate on tourism balances. In the context of the J-curve theory, it shows whether the tourism balances initially deteriorate following the depreciation of the local currency. A negative and statistically significant "ECM_{t-1}" suggests that tourism balances initially worsens following the depreciation of the local currency and hence provide support for the J-curve theory. Otherwise, and insignificant "ECM_{t-1}" indicate that tourism balances do not worsen following the depreciation of the local currency. Rather, tourism balances improve immediately following the depreciation of the local currency and thus contradicting the J-curve theory's postulations.

4. Empirical results

The relationships between the U.S. tourism trade balance and bilateral exchange rate between three of its trading partners, Canada, Mexico, and the U.K., were examined utilizing both linear and nonlinear ARDL. While the former can be employed if the relationship between exchange rate and tourism trade balance is symmetric, the latter needs to be employed when this relationship is asymmetric. However, the symmetric or asymmetric natures of the relationships cannot be assumed in econometric models without running relevant statistical tests. Therefore, we employed Wald tests of symmetry (W_{LR}) to examine the nature of this relationship prior to interpreting our findings, as suggested by the studies of Bahmani-Oskooee and Hegerty (2011), Bahmani-Oskooee and Fariditavana (2016), and Bahmani-Oskooee et al. (2016). The results from the linear ARDL cointegration and error correction model are presented in Table 3.

Before interpreting the coefficient estimates, the overall significance of the model must be investigated. Diagnostic tests, such as R-squared and adjusted R-squared, which show whether the model yields reliable coefficient estimates, suggest that the coefficients are jointly significant for each model. F tests further show that the dependent and independent variables are jointly cointegrated, suggesting that there is a long-term relationship between the U.S. tourism trade balances and bilateral exchange rates. According to the results from the analysis of the linear ARDL model, the coefficient of the U.S. income is positive in all models, while the coefficients of the U.S. trading partners' incomes are negative. These results suggest that growth in the U.S. income improves the U.S. tourism trade balances, whereas growth in its trading partners' income deteriorates the U.S. tourism trade balances. The coefficients of the real exchange rate (EXC), which are the primary focus of our study, are positive and statistically significant in both the short and the long run with one exception.

The results from the Zivot-Andrews unit root test suggest that structural breaks exist in our model. Therefore, we repeated our empirical analyses incorporating dummy variables for the identified structural breaks into the model. The "Appendix: ARDL with Structural Breaks" presents our findings. The results clearly show that structural breaks do not alter our primary findings. That is, our results are robust to structural breaks and hence we are able to confirm our findings. These results collectively suggest that there is no evidence of a J-curve pattern in the bilateral trade balance between the U.S. and the focal trading partners of this study.

Thus, our results, which are in line with the studies of Arora et al. (2003), Bahmani-Oskooee and Ratha (2004), and Bahmani-Oskooee et al. (2006), similarly do not support the postulations of the J-curve theory proposed by the studies of Bahmani-Oskooee (1985) and Rose and Yellen (1989). The positive coefficients of bilateral exchange rates in the U.S.–Canada and the U.S.–U.K. models suggest that depreciations in the U.S. dollar improve the bilateral tourism trade balance of the U.S. with Canada and the U.K. Although there is no evidence of the effect of exchange rate on the bilateral tourism trade balance of the U.S. with Mexico, this outcome might be due to the fact that we analyzed this relationship using the linear ARDL econometric model—that is, the relationship between the exchange rate and the bilateral tourism trade balance between the U.S. and Mexico might be nonlinear. Therefore, we further examined the effect of exchange rate on bilateral tourism trade balance between the U.S. and Canada, Mexico, and the U.K. Table 4 presents these results.

Table 3
Linear ARDL.

	USA-MEXICO			USA-CANADA			USA-UK		
Long-run estimates	Variables	Coef.	t stat	Variables	Coef.	t stat	Variables	Coef.	t stat
	Constant	−2.19	−0.41	*Constant*	−0.46	−0.14	*Constant*	−0.54	−0.11
	lnY_{USA}	12.31	6.02***	lnY_{USA}	3.01	1.02	lnY_{USA}	2.98	1.01
	lnY_{MEX}	−12.11	−9.71***	lnY_{CAN}	−3.41	−1.01	lnY_{UK}	−3.41	−0.99
	lnREX	0.22	0.43	*lnREX*	3.06	2.53**	*lnREX*	3.07	2.61**
Short-run estimates	$\Delta lnTOB_{t-1}$	−0.42	−5.21***	$\Delta lnTOB_{t-1}$	−0.26	−4.77***	$\Delta lnTOB_{t-1}$	−0.24	−4.68***
	$\Delta lnTOB_{t-2}$	−0.28	−3.70***	$\Delta lnTOB_{t-2}$	−0.27	−4.64***	$\Delta lnTOB_{t-2}$	−0.25	−4.71***
	$\Delta lnTOB_{t-3}$	−0.18	−2.25**	$\Delta lnTOB_{t-3}$	−0.27	−4.78***	$\Delta lnTOB_{t-3}$	−0.25	−4.79***
	$\Delta lnTOB_{t-4}$	−0.24	−3.69***	$\Delta lnTOB_{t-4}$	−0.28	−5.44***	$\Delta lnTOB_{t-4}$	−0.29	−5.52***
	$\Delta lnTOB_{t-5}$	−0.29	−4.05***	$\Delta lnTOB_{t-5}$	−0.30	−5.42***	$\Delta lnTOB_{t-5}$	−0.30	−5.39***
	$\Delta lnTOB_{t-6}$	−0.53	−6.99***	$\Delta lnTOB_{t-6}$	−0.29	−5.68***	$\Delta lnTOB_{t-6}$	−0.29	−5.65***
	$\Delta lnTOB_{t-7}$	−0.34	−5.15***	$\Delta lnTOB_{t-7}$	−0.33	−5.92***	$\Delta lnTOB_{t-7}$	−0.32	−6.00***
	$\Delta lnTOB_{t-8}$	−0.33	−4.36***	$\Delta lnTOB_{t-8}$	−0.33	−5.95***	$\Delta lnTOB_{t-8}$	−0.32	−5.96***
	$\Delta lnTOB_{t-9}$	−0.25	−3.53***	$\Delta lnTOB_{t-9}$	−0.34	−5.94***	$\Delta lnTOB_{t-9}$	−0.36	−5.88***
	$\Delta lnTOB_{t-10}$	−0.39	−5.54***	$\Delta lnTOB_{t-10}$	−0.34	−6.40***	$\Delta lnTOB_{t-10}$	−0.36	−6.43***
	$\Delta lnTOB_{t-11}$	−0.35	−5.10***	$\Delta lnTOB_{t-11}$	−0.35	−6.74***	$\Delta lnTOB_{t-11}$	−0.37	−6.66***
	$\Delta lnTOB_{t-12}$	0.15	2.44**	$\Delta lnTOB_{t-12}$	0.60	10.52***	$\Delta lnTOB_{t-12}$	0.60	10.52***
	$\Delta lnY_{USA\ t-5}$	−8.02	−4.23***	$\Delta lnY_{CAN t-1}$	−0.88	−2.00**	$\Delta lnY_{UK\ t-5}$	−0.83	−1,98**
	$\Delta lnY_{USA\ t-6}$	−4.36	−2.16**	$\Delta lnY_{CAN t-5}$	1.97	4.28***	$\Delta lnY_{UK\ t-6}$	1.98	4.31***
	$\Delta lnREX_{t-5}$	1.37	2.49**						
	$\Delta lnREX_{t-9}$	1.55	2.74***						
Diagnostic statistic									
	F = 12.30***			F = 8.43***			F = 7.29***		
	R^2 = 0.68 Adj. R^2 = 0.65			R^2 = 0.94 Adj. R^2 = 0.93			R^2 = 0.87 Adj. R^2 = 0.86		
	ECM_{t-1}: 0.29 (4.95)			ECM_{t-1}: 0.11(2.66)			ECM_{t-1}: 0.08 (3.32)		
	χ^2_{SC} = 18.29[0.10]			χ^2_{SC} = 9.47 [0.008] The Newey-West correction is applied.			χ^2_{SC} = 11.21 [0.009] The Newey-West correction is applied.		
	χ^2_{HET} = 0.63 [0.42]			χ^2_{HET} = 10.83 [0.90]			χ^2_{HET} = 6.85 [0.84]		

Figures in parentheses and brackets are the t-statistics and p-values, respectively. The short-run coefficients were only reported fort the values that are statistically significant for the sake of brevity.

Table 4
Non-linear ARDL.

	USA-MEXICO			USA-CANADA			USA-UK		
Long-run estimates	Variables	Coef.	t stat	Variables	Coef.	t stat	Variables	Coef.	t stat
	Constant	−8.72	−2.27**	Constant	115.48	0.17	Constant	121.7	0.17
	lnY_{USA}	6.88	4.88***	lnY_{USA}	24.55	0.19	lnY_{USA}	24.54	0.17
	lnY_{MEX}	−4.84	−2.83***	lnY_{CAN}	−50.49	−0.19	lnY_{UK}	−50.51	−0.17
	POS	0.39	1.33	*POS*	36.66	0.19	*POS*	36.59	0.17
	NEG	1.12	3.22***	*NEG*	31.82	0.20	*NEG*	31.84	0.18
Short-run estimates	$\Delta lnTOB_{t-1}$	−0.22	−3.70***	$\Delta lnTOB_{t-1}$	−0.39	−5.77***	$\Delta lnTOB_{t-1}$	−0.38	−5.65***
	$\Delta lnTOB_{t-2}$	−0.11	−2.58**	$\Delta lnTOB_{t-2}$	−0.40	−6.12***	$\Delta lnTOB_{t-2}$	−0.40	−6.07***
	$\Delta lnTOB_{t-4}$	−0.11	−2.66***	$\Delta lnTOB_{t-3}$	−0.39	−6.23***	$\Delta lnTOB_{t-3}$	−0.41	−6.02***
	$\Delta lnTOB_{t-5}$	−0.16	−3.29***	$\Delta lnTOB_{t-4}$	−0.40	−6.75***	$\Delta lnTOB_{t-4}$	−0.42	−6.78***
	$\Delta lnTOB_{t-6}$	−0.38	−6.99***	$\Delta lnTOB_{t-5}$	−0.40	−6.61***	$\Delta lnTOB_{t-5}$	−0.42	−6.53***
	$\Delta lnTOB_{t-7}$	−0.28	−5.54***	$\Delta lnTOB_{t-6}$	−0.38	−6.68***	$\Delta lnTOB_{t-6}$	−0.40	−6.69***
	$\Delta lnTOB_{t-8}$	−0.249	−3.33***	$\Delta lnTOB_{t-7}$	−0.42	−7.48***	$\Delta lnTOB_{t-7}$	−0.44	−7.48***
	$\Delta lnTOB_{t-9}$	−0.166	−2.89***	$\Delta lnTOB_{t-8}$	−0.40	−7.35***	$\Delta lnTOB_{t-8}$	−0.42	−7.40***
	$\Delta lnTOB_{t-10}$	−0.31	−5.34***	$\Delta lnTOB_{t-9}$	−0.41	−7.05***	$\Delta lnTOB_{t-9}$	−0.43	−7.11***
	$\Delta lnTOB_{t-11}$	−0.30	−5.04***	$\Delta lnTOB_{t-10}$	−0.42	−8.24***	$\Delta lnTOB_{t-10}$	−0.42	−8.24***
	$\Delta lnTOB_{t-12}$	0.20	2.58**	$\Delta lnTOB_{t-11}$	−0.42	−7.90***	$\Delta lnTOB_{t-11}$	−0.42	−7.93***
	$\Delta lnY_{USA\ t-5}$	−8.74	−3.91***	$\Delta lnTOB_{t-12}$	0.53	9.82***	$\Delta lnTOB_{t-12}$	0.56	9.93***
	$\Delta lnY_{USA\ t-6}$	−5.26	−2.22**	ΔlnY_{USAt-7}	1.87	2.66***	ΔlnY_{USAt-7}	1.91	2.74***
	$\Delta lnY_{MEX\ t-12}$	−3.12	−2.18**	ΔlnY_{CANt-5}	2.05	4.69***	ΔlnY_{CANt-5}	2.02	4.53***
	ΔPOS_{t-5}	1.77	3.35***	ΔPOS_{t-1}	1.23	3.61***	ΔPOS_{t-1}	1.27	3.62***
	ΔNEG_{t-9}	3.76	3.12***	ΔPOS_{t-4}	0.88	1.58	ΔPOS_{t-4}	0.86	1.53
				ΔPOS_{t-8}	1.10	3.56***	ΔPOS_{t-8}	1.11	3.51***
Diagnostic statistic									
F = 12.76***				F = 6.02***			F = 5.56***		
R^2 = 0.70Adj. R^2 = 0.67				R^2 = 0.95 Adj. R^2 = 0.94			R^2 = 0.88 Adj. R^2 = 0.87		
ECM_{t-1}: 0.44 (7.26)				ECM_{t-1}: 0.009 (0.19)			ECM_{t-1}: 0.007 (0.17)		
χ^2_{SC} = 25.97 [0.01] The Newey-West correction is applied.				χ^2_{SC} = 9.54 [0.008] The Newey-West correction is applied			χ^2_{SC} = 11.18 [0.009] The Newey-West correction is applied		
χ^2_{HET} = 0.37 [0.54]				χ^2_{HET} = 13.97 [0.90]			χ^2_{HET} = 14.25 [0.90]		
W_{LR} = 10.58[0.001]				W_{LR} = 4.86[0.86]			W_{LR} = 4.69[0.85]		

Pesaran et al. (2001) tabulate the %5 critical values for k = 3 as follows: F_{crit} = 4.35, k = 4 as follows: F_{crit} = 4.01, *** %1, **: %5, *: %10. χ^2_{SC}, χ^2_{HET}, denote LM tests for serial correlation, Heteroscedasticit (ARCH), Figures parentheses are the associated t statistic and insquare parentheses are the associated p-values. W_{LR} refers to the Wald test of long-run symmetry. Figures in parentheses and brackets are the t-statistics and p-values, respectively. The short-run coefficients were only reported fort the values that are statistically significant for the sake of brevity.

The significance of the model needs to be examined before interpreting the coefficient estimates. Our R-squared and adjusted R-squared results show that the coefficients are jointly significant for each model. F tests further show that the dependent and independent variables are jointly cointegrated, suggesting that there is a relationship between the U.S. tourism trade balances and bilateral exchange rates. The symmetrical (i.e., linear) or asymmetrical (i.e., nonlinear) natures of the relationships cannot be assumed in econometrical models without conducting pertinent statistical tests. Thus, we also investigated the nature of the relationships for each model. According to the results of the Wald tests of symmetry (W_{LR}) presented in Table 4, the relationships between the exchange rate and the bilateral tourism trade balance between the U.S. and Canada and the U.S. and the U.K. are symmetrical, whereas the relationship between the exchange rate and the bilateral tourism trade balance between the U.S. and Mexico is asymmetrical. Therefore, we are able to rely on the coefficients of the symmetrical analysis for the relationship between the exchange rate and the bilateral tourism trade balance between the U.S. and Canada and the U.S. and the U.K. (i.e., Table 3)—or, in other words, both depreciations and appreciations of the U.S. dollar have similar effects on the U.S. tourism bilateral tourism trade balances with both Canada and the U.K. In contrast, the asymmetric nature of the relationship between the U.S. and Mexico suggests that depreciations or appreciations of the U.S. dollar have varying effects on the U.S. tourism bilateral tourism trade balance between the U.S. and Mexico. Therefore, one must refer to the coefficients of the asymmetrical analysis of the relationship between the exchange rate and the bilateral tourism trade balance between the U.S. and Mexico (i.e., Table 4).

Accordingly, the results from the nonlinear estimates of the US–MEX model show that the coefficients of both depreciations and appreciations are positive and statistically significant immediately following these fluctuations, suggesting that both depreciations and appreciations of the U.S. dollar against the Mexican peso improve the bilateral tourism trade balance between the U.S. and Mexico within this timeframe. While the coefficients of both depreciations and appreciations are also positive in the long run, the coefficient of appreciation is statistically insignificant at conventional statistical significance levels. These results suggest that depreciations of the U.S. dollar against the Mexican peso are more likely to improve the bilateral tourism trade balance between the U.S. and Mexico both in the short run and the long run, in contrast to the J-curve theory.

The linear and nonlinear ARDL cointegration and error-correction methodology allows for an even more thorough examination of the correction period of the bilateral tourism trade balances between the U.S. and the three trading partners featured in this study. The ECM figures in the respective models show that 0.9%, 44%, and 0.7% of the U.S. tourism trade deficits with, respectively, Canada, Mexico, and the U.K. are corrected every month. Thus, deviations from the U.S. tourism trade balances with Canada, Mexico, and the U.K. are ultimately corrected in 9 (1/0.009), 2, (1/0.44), and 13 (1/0.007) months. That is, the depreciation of the U.S. dollar against the currencies of Canada, Mexico, and the U.K. will improve the U.S. tourism trade balance and correct the balance of trade in 9, 2, and 13 months, respectively.

5. Discussion

We examined the effects of currency depreciations and appreciations on the U.S. tourism balances against Canada, Mexico, and the U.K. The results showed that currency depreciations do affect the tourism trade balances of the U.S. between Canada, Mexico, and the U.K. Nevertheless, the depreciation of the U.S. dollar does not seem to have an immediate adverse effect on the tourism trade balances of the U.S., as the J-curve theory would suggest. Thus, our findings do not support the predictions of the J-curve theory, as proposed by the studies of Magee (1973), Bahmani-Oskooee (1985), and Rose and Yellen (1989), which conclude that currency depreciation initially deteriorates the trade balance but improves it over time.

Instead, our findings showed that the U.S. tourism trade balance improves immediately following depreciations of the U.S. dollar. These results collectively provide support for the ML condition, which argues that a country could improve its balance of trade via the depreciation of its currency (Alexander, 1952; Branson, 1972; Marshall, 1923). Following depreciation, imports become more expensive and hence demand decreases, whereas exports become less expensive and thus demand in the global marketplace increases.

Our results showed that the relationship between the bilateral exchange rate and the tourism trade balance between the U.S. and Canada and the U.S. and the U.K. is symmetrical, but this relationship is asymmetrical between the U.S. and Mexico. These results suggest that both depreciations and appreciations of the U.S. dollar have similar effects on the U.S. tourism trade balance with both Canada and the U.K. However, depreciations and appreciations of the U.S. dollar each show different effects on the U.S. tourism trade balance between the U.S. and Mexico. Therefore, we must rely on the coefficients of the asymmetrical analysis for the relationship between the bilateral exchange rate and the tourism trade balance between the U.S. and Mexico. According to the results from the asymmetric ARDL cointegration and error correction model, both depreciations and appreciations immediately improve the U.S. tourism trade balance. While the results also show that depreciations of the U.S. dollar against the Mexican peso improve the U.S. tourism trade balance over time, the appreciation of the U.S. dollar against the Mexican peso does not ultimately affect the U.S. tourism trade balance.

The results support the notion that the relationship between the bilateral exchange rate and the trade balance is not always symmetrical (Bahmani-Oskooee & Fariditavana, 2016; Bahmani-Oskooee et al., 2016). Thus, assuming a symmetrical relationship between bilateral exchange rate and the trade balance and conducting analyses under this assumption would yield spurious results. These results also provide evidence contradicting the J-curve theory and supporting the ML condition and the studies of Bahmani-Oskooee and Hegerty (2011), Bahmani-Oskooee and Fariditavana (2016), and Bahmani-Oskooee et al. (2016), showing that the nature of the relationship between the exchange rate and bilateral trade balance must be investigated.

We must also note that the coefficients of income were only significant in the first model, in which the U.S. tourism trade balance with Mexico was modeled. We expect that when income increases, demand for international travel and tourism also increases. However, this does not seem to be the case for international tourism between the U.S. and its three trading partners. It could be that tourists from these countries are more sensitive to the fluctuations on exchange rate than their income levels (Crouch, 1994; Dogru et al., 2017). Overall, our results suggest that exchange rate and tourism trade balance are strongly dependent, and that depreciations of the U.S. dollar improve the bilateral tourism trade balances of the U.S. with Canada, Mexico, and the U.K. While appreciations of the U.S. dollar deteriorate the bilateral tourism trade balance between the U.S. and Canada and the U.K. over time, they do not substantively affect the bilateral tourism trade balance of the U.S. with Mexico.

6. Conclusion

International trade flows continue to be at the core of public debate in the U.S. and across the globe due to increasing bilateral trade deficits between countries. It is a stylized fact that most of the products consumers purchase have been partly or fully produced or manufactured in foreign countries. Policymakers have been aggressively proposing new economic strategies and policies to correct the balance of these trade deficits, such as import tariffs or border taxes on imports, which are common protectionist economic policy tools that lead to increased prices of imported goods (Dixit & Norman, 1980; Madura, 2011) and, subsequently, reduced demand for them. However, tariffs may lead to an increase in the value of a given country's local currency against different foreign currencies, thereby reducing the demand for locally produced goods in the global market due to their higher prices (Eichengreen, 1981).

Although a country might have an overall balance of trade deficit in the international market, some specific sectors of the economy might instead have a surplus. Therefore, countries have started to capitalize on certain industries to improve their overall balance of trade. In the context of international trade, international tourism provides substantial economic benefits to any countries with a balance of trade deficit by reducing its unemployment rate, producing higher tax revenues, increasing the number of jobs, and, most importantly, correcting the balance of trade (Dogru & Bulut, 2018; Jones, 1967; Madura, 2011; Song et al., 2012). Furthermore, an increase in the demand for international tourism stimulates economic growth through the accumulation of educated and skilled labor in the tourism sector. The international trade theory postulates that with a balance of trade surplus, skilled employment will flow to the country (Dixit & Norman, 1980; Jones, 1967; Madura, 2011). Competitive tourism not only attracts tourists from abroad but also makes destinations more attractive for locals. Indeed, currency depreciation will make outbound tourism less affordable for locals. Hence, locals are likely to substitute international tourism with domestic equivalents.

The contributions of tourism to international trade and correcting a country's balance of trade deficit have made tourism a very appealing industry in national economies. For this study, the question was whether tourism can help correct the balance of trade in the U.S. To answer this, we investigated the effects of currency depreciation and appreciation on the U.S. tourism trade balances with Canada, Mexico, and the U.K., utilizing both linear and nonlinear ARDL cointegration and error-correction models, which take the symmetricality of the relationship into account and thus generate efficient and unbiased estimates.

The results have provided evidence contradicting the J-curve theory, which states that currency depreciations initially worsen—but eventually improve— a country's trade balance. Our results instead showed that depreciations of the U.S. dollar improve the trade balance both initially and over time, supporting instead the postulations of the ML condition. While findings from previous studies have also provided some support for the ML condition within the context of the U.S., these studies also assumed a linear relationship between the exchange rate and tourism trade balances. However, our results showed that this relationship was asymmetric in nature, at least between the U.S. and Mexico. Therefore, our study provides evidence that assuming a linear relationship between the exchange rate and balance of trade could yield biased estimates, which would lead to unfitting economic policy decisions.

6.1. Theoretical and policy implications

Theoretically, this study has found evidence supporting the ML condition, as opposed to the many studies that provide support for the J-curve theory (see, e.g., Bahmani-Oskooee & Fariditavana, 2016; Bahmani-Oskooee & Hegerty, 2011 Junz & Rhomberg, 1973; Magee, 1973). According to ML condition, a country could improve its balance of trade via the coordinated deprecation of its currency. Following depreciation, prices of imports become more expensive, which decreases demand. Simultaneously, exports become less expensive, so demand for these locally produced goods and services increases in the global marketplace.

It must be noted that biased estimates are likely to arise if the symmetricality of the data is not considered. We utilized the linear and nonlinear ARDL cointegration and error-correction methodology developed by Shin et al. (2014, pp. 281–314) and Pesaran et al. (2001) to address this. Our results indicate that the relationship between bilateral exchange rate and tourism trade balances cannot be automatically assumed to be symmetrical. Accordingly, this study contributes to the tourism literature by presenting unbiased and efficient estimates of the relationship between bilateral exchange rate and tourism trade balances.

From a practical perspective, policymakers should strategically consider, and potentially alter, the exchange rate as an economic policy tool to correct the overall balance of trade. The exchange rate plays a significant role in international tourism: for example, less expensive tourism products and services are likely to increase the inbound tourism demand. While a highly valued national currency suggests that there is a high demand for said currency around the world, it may be detrimental to the international tourism industry. A more highly valued national currency would cause locals to prefer international tourism over domestic tourism and, as inbound tourism would also be more expensive, international tourists would likely choose alternative international destinations. The combined effect of increased demand for international tourism from locals and reduced demand for inbound tourism from tourists would yield a deficit in the tourism balance of trade. Governments or central bank authorities should use economic practices, such as reducing the interest rates and initiating quantitative easing programs, to depreciate the local currency against certain or all other currencies, because depreciation will both increase the international tourism demand from foreign countries and reduce the locals' desire for international tourism abroad. Indeed, the depreciation of local currency will not only increase international tourism demand, but it will also make locally produced goods and services more affordable abroad, thereby increasing exports and further improving the balance of trade.

The findings of the present study also suggest that focusing on tourism could quite feasibly help countries to manage their balances of trade. In addition to exchange rate depreciations, policymakers should consider providing subsidies to firms in selected sectors of the economy to try to improve the balance of trade. Governments should also offer export subsidies to tourism companies to increase the international tourism demand. While export subsidies can come in many forms, governments can offer interest-free loans with a deferred pay structure or provide free land to build new operations, such as hotels, resorts, amusement parks, or other tourism and hospitality businesses, to encourage and support stakeholders within the tourism industry. Governments should even consider prioritizing exports subsidies for tourism and hospitality firms to stimulate economic growth and manage the balance of trade deficits; they can exploit opportunities that the tourism industry has to offer for sustainable economic growth and the management of the country's balance of trade, as tourism development promotes economic growth through tax revenues, capital investments, new jobs, and other socioeconomic factors.

Furthermore, lifting or easing visa requirements for visitors could also increase the demand for international tourism and correct deficits in the balance of trade. Combined with the depreciation of the local currency, visiting a country without the need for a tourist visa would attract more tourists to a given country. Tourism and travel firms can also attract more tourists by creating new tourism niches, such as medical tourism, ecotourism, food tourism, and so on.

Additionally, while the exchange rate policy is solely determined by governments or central bank authorities, tourism and travel companies can provide alternative solutions when the local currency appreciates against foreign currencies. Tourism and travel firms can provide services at previously fixed exchange rates, or even at discounted rates, to maintain the international tourism demand. While this strategy will not affect local tourism and travel firms in local currency, it will make tourism services relatively less expensive for tourists. Therefore, the international tourism demand can be maintained, despite any appreciation of a currency in the exchange market.

6.2. Limitations and recommendations for future research

Although the findings of this study make significant contributions to the bodies of international trade, economics, and tourism literature, like any other study, it is not immune from limitations. While the results of this study have shown that the tourism industry could provide certain opportunities to manage the balance of trade and increase countries' competitiveness in the global marketplace, government officials need to know the strength and composition of all the industries in their economies. However, our study was limited to the tourism industry. Therefore, future studies should analyze the extent to which bilateral exchange rates affect the trade balances of other industries. Analyzing the relationship between bilateral exchange rate and the balance of trade at the industry level will also allow for a comparison of the tourism industry against other industries in terms of contributing to correcting the balance of trade. Determining the extent of this relationship and impact can help policymakers to devise better strategies and policies to stimulate economic growth and manage the balance of trade.

Although we analyzed the effects of exchange rate depreciations and appreciations on the tourism balance of trade, there might be other factors that could affect it as well that we did not include in this study. Export subsidies, tariffs, interest rates, inflation, and border tax adjustments, for example, are some of the major economic policy tools that can be used to manage deficits in the balance of trade. Therefore, future studies should investigate the effects of these factors on the balance of trade. Additionally, the analyses are limited to the U.S. and three of its trading partners, Canada, Mexico, and the U.K. Therefore, the replication of this study in different samples and country pair settings may corroborate or contradict our findings.

Author contribution

Dr. Tarik Dogru developed the theoretical framework and presented the discussion and conclusion along with theoretical and policy implications. Dr. Cem Isik designed the general framework of the study and implemented the empirical analysis. Dr. Tarik Dogru and Dr. Cem Isik wrote the manuscript with support from Dr. Ercan Sirakaya-Turk. All authors discussed and contributed to the theoretical framework, empirical strategy, and results and commented on the manuscript.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tourman.2019.01.014.

Appendix. ARDL with Structural Breaks

	USA-MEXICO			USA-CANADA			USA-UK		
Long-run estimates	*Variables*	Coef.	t-stat	Variables	Coef.	t-stat	Variables	Coef.	t-stat
	Constant	−2.32	−0.40	*Constant*	−0.48	−0.13	*Constant*	−0.51	−0.10
	lnY_{USA}	11.28	6.29***	lnY_{USA}	3.22	1.16	lnY_{USA}	3.01	1.12
	lnY_{MEX}	−11.02	−8.17***	lnY_{CAN}	−3.25	−1.26	lnY_{UK}	−3.26	−0.91
	lnREX	0.26	0.39	*lnREX*	3.11	2.62**	*lnREX*	3.15	2.58**
	D_2008	−0.48	−0.04	D_2008	−0.58	0.67	D_2008	−0.44	0.62
	D_2010	−0.36	3.69***	D_2010	−0.22	2.58**	D_2010	−0.24	2.55**
	D_2012	0.19	0.56	D_2012	0.11	0.24	D_2012	0.12	0.20
Short-run estimates	$\Delta lnTOB_{t-1}$	−0.40	−5.14***	$\Delta lnTOB_{t-1}$	−0.25	−4.71***	$\Delta lnTOB_{t-1}$	−0.23	−4.72***
	$\Delta lnTOB_{t-2}$	−0.33	−3.66***	$\Delta lnTOB_{t-2}$	−0.26	−4.60***	$\Delta lnTOB_{t-2}$	−0.26	−4.75***
	$\Delta lnTOB_{t-3}$	−0.19	−2.18**	$\Delta lnTOB_{t-3}$	−0.26	−4.77***	$\Delta lnTOB_{t-3}$	−0.26	−4.78***
	$\Delta lnY_{USA\ t-5}$	−7.94	−4.21***	$\Delta lnY_{CAN t-5}$	−0.90	−2.10**	$\Delta lnY_{UK\ t-5}$	−0.81	−2.01**
	$\Delta lnY_{USA\ t-6}$	−4.27	−2.15**	$\Delta lnY_{CAN t-6}$	1.99	4.23***	$\Delta lnY_{UK\ t-6}$	1.96	4.26***
	$\Delta lnREX_{t-1}$	1.49	2.53**						
	$\Delta lnREX_{t-2}$	1.54	2.79***						
	$\Delta lnREX_{t-3}$	1.56	2.87***						
	$\Delta lnREX_{t-4}$	1.57	2.70***						
Diagnostic statistic									
	F = 13.08***			F = 21.16***			F = 20.28***		
	R^2 = 0.55 Adj. R^2 = 0.51			R^2 = 0.90 Adj. R^2 = 0.88			R^2 = 0.87 Adj. R^2 = 0.84		
	ECM_{t-1}: 0.27 (4.86)			ECM_{t-1}: 0.12(2.33)			ECM_{t-1}: 0.07 (3.47)		
	χ^2_{SC} = 17.42[0.09]			χ^2_{SC} = 8.6 [0.006] The Newey-West correction is applied.			χ^2_{SC} = 10.14 [0.001] The Newey-West correction is applied.		
	χ^2_{HET} = 0.56 [0.38]			χ^2_{HET} = 9.64 [0.90]			χ^2_{HET} = 6.93 [0.79]		

Figures in parentheses and brackets are the t-statistics and p-values, respectively. The short-run coefficients were only reported fort the values that are statistically significant for the sake of brevity.

References

Alexander, S. S. (1952). Effects of a devaluation on a trade balance. *Staff Papers, 2*(2), 263–278.

Arora, S., Bahmani-Oskooee, M., & Goswami, G. (2003). Bilateral J-curve between India and her trading partners. *Applied Economics, 35*(9), 1037–1041.

Bahmani-Oskooee, M. (1985). Devaluation and the J-curve: Some evidence from LDCs. *The Review of Economics and Statistics, 67*(3), 500–504.

Bahmani-Oskooee, M., & Brooks, T. J. (1999). Bilateral J-curve between US and her trading partners. *Weltwirtschaftliches Archiv, 135*(1), 156–165.

Bahmani-Oskooee, M., Economidou, C., & Goswami, G. G. (2006). Bilateral J-curve between the UK vis-à-vis her major trading partners. *Applied Economics, 38*(8), 879–888.

Bahmani-Oskooee, M., & Fariditavana, H. (2015). Nonlinear ARDL approach, asymmetric effects and the J-curve. *Journal of Economics Studies, 42*(3), 519–530.

Bahmani-Oskooee, M., & Fariditavana, H. (2016). Nonlinear ARDL approach and the J-curve phenomenon. *Open Economies Review, 27*(1), 51–70.

Bahmani-Oskooee, M., Halicioglu, F., & Hegerty, S. W. (2016). Mexican bilateral trade and the J-curve: An application of the nonlinear ARDL model. *Economic Analysis and Policy, 50*, 23–40.

Bahmani-Oskooee, M., & Hegerty, S. W. (2010). The J-and S-curves: A survey of the recent literature. *Journal of Economics Studies, 37*(6), 580–596.

Bahmani-Oskooee, M., & Hegerty, S. W. (2011). The J-curve and NAFTA: Evidence from commodity trade between the US and Mexico. *Applied Economics, 43*(13), 1579–1593.

Bahmani-Oskooee, M., & Ratha, A. (2004). The J-curve: A literature review. *Applied Economics, 36*(13), 1377–1398.

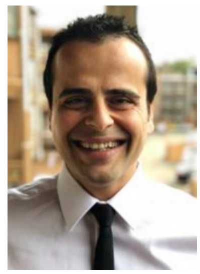
Bahmani-Oskooee, M., & Kovyryalova, M. (2008). Impact of exchange rate uncertainty on trade flows: Evidence from commodity trade between the United States and the United Kingdom. *The World Economy, 31*(8), 1097–1128.

Branson, W. H. (1972). The trade effects of the 1971 currency realignments. *Brookings Papers on Economic Activity, 1972*(1), 15–69.

Brissimis, S. N., & Leventakis, J. A. (1989). The effectiveness of devaluation: A general equilibrium assessment with reference to Greece. *Journal of Policy Modeling, 11*(2), 247–271.

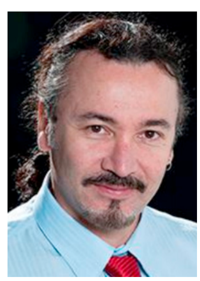
Cheng, K. M., Kim, H., & Thompson, H. (2013). The real exchange rate and the balance of trade in US tourism. *International Review of Economics & Finance, 25*, 122–128.

Chi, J. (2015). Dynamic impacts of income and the exchange rate on US tourism, 1960–2011. *Tourism Economics, 21*(5), 1047–1060.
Croes, R. R. (2006). A paradigm shift to a new strategy for small island economies: Embracing demand side economics for value enhancement and long term economic stability. *Tourism Management, 27*(3), 453–465.
Crouch, G. I. (1994). Demand elasticities for short-haul versus long-haul tourism. *Journal of Travel Research, 33*(2), 2–7. https://doi.org/10.1177/004728759403300201.
Crouch, G. I. (1996). Demand elasticities in international marketing: A meta-analytical application to tourism. *Journal of Business Research, 36*(2), 117–136.
De Vita, G., & Kyaw, K. S. (2013). Role of the exchange rate in tourism demand. *Annals of Tourism Research, 43*, 624–627. https://doi.org/10.1016/j.annals.2013.07.011.
Dixit, A., & Norman, V. (1980). *Theory of international trade: A dual, general equilibrium approach.* Cambridge University Press.
Dogru, T., & Bulut, U. (2018). Is tourism an engine for economic recovery? Theory and empirical evidence. *Tourism Management, 67*, 0261–5177.
Dogru, T., & Sirakaya-Turk, E. (2016). Modeling Turkish outbound tourism demand using a dynamic panel data approach. *Tourism and Hospitality Research*. https://doi.org/10.1177/1467358416663822.
Dogru, T., Sirakaya-Turk, E., & Crouch, G. I. (2017). Remodeling international tourism demand: Old theory and new evidence. *Tourism Management, 60*, 47–55. https://doi.org/10.1016/j.tourman.2016.11.010.
Dwyer, L., Forsyth, P., Madden, J., & Spurr, R. (2000). Economic impacts of inbound tourism under different assumptions regarding the macroeconomy. *Current Issues in Tourism, 3*(4), 325–363.
Eichengreen, B. J. (1981). A dynamic model of tariffs, output and employment under flexible exchange rates. *Journal of International Economics, 11*(3), 341–359.
Isik, C. (2015). Foreign direct investment in tourism: Panel data analysis of D7 countries. *Athens Journal of Tourism, 2*(2), 93–103.
Isik, C., Dogru, T., & Turk, E. S. (2018). A nexus of linear and non-linear relationships between tourism demand, renewable energy consumption, and economic growth: Theory and evidence. *International Journal of Tourism Research, 20*(1), 38–49.
Jones, R. W. (1967). International capital movements and the theory of tariffs and trade. *Quarterly Journal of Economics, 81*(1), 1–38.
Junz, H. B., & Rhomberg, R. R. (1973). Price competitiveness in export trade among industrial countries. *The American Economic Review, 63*(2), 412–418.
Kotler, P., & Gertner, D. (2002). Country as brand, product, and beyond: A place marketing and brand management perspective. *Journal of Brand Management, 9*(4), 249–261.
Lerner, A. P. (1946). The economics of control. *Science & Society, 10*(4), 416–419.
Madura, J. (2011). *International financial management* (9 ed.). Mason, OH: Cengage Learning.
Magee, S. P. (1973). Currency contracts, pass-through, and devaluation. *Brookings Papers on Economic Activity, 1973*(1), 303–325.
Marshall, A. (1923). Money, credit and commerce. *Journal of the Royal Statistical Society, 86*(3), 430–433.
Martins, L. F., Gan, Y., & Ferreira-Lopes, A. (2017). An empirical analysis of the influence of macroeconomic determinants on World tourism demand. *Tourism Management, 61*, 248–260.
Miles, M. A. (1979). The effects of devaluation on the trade balance and the balance of payments: Some new results. *Journal of Political Economy, 87*(3), 600–620.
Narayan, P. K., & Narayan, S. (2004). The J-curve: Evidence from Fiji. *International Review of Applied Economics, 18*(3), 369–380.
Obstfeld, M., Rogoff, K. S., & Wren-lewis, S. (1996). *Foundations of international macroeconomics*, *Vol. 30*. MA: MIT press Cambridge.
Patsouratis, V., Frangouli, Z., & Anastasopoulos, G. (2005). Competition in tourism among the Mediterranean countries. *Applied Economics, 37*(16), 1865–1870. https://doi.org/10.1080/00036840500217226.
Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326.
Rose, A. K., & Yellen, J. L. (1989). Is there a J-curve? *Journal of Monetary Economics, 24*(1), 53–68.
Russo, A. P. (2002). The "vicious circle" of tourism development in heritage cities. *Annals of Tourism Research, 29*(1), 165–182.
Shin, Y., Yu, B., & Greenwood-Nimmo, M. (2014). *Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework Festschrift in Honor of Peter Schmidt.* Springer.
Song, H., Dwyer, L., Li, G., & Cao, Z. (2012). Tourism economics research: A review and assessment. *Annals of Tourism Research, 39*(3), 1653–1682. https://doi.org/10.1016/j.annals.2012.05.023.
Song, H., & Li, G. (2008). Tourism demand modelling and forecasting: A review of recent research. *Tourism Management, 29*(2), 203–220. https://doi.org/10.1016/j.tourman.2007.07.016.
Uysal, M., & Crompton, J. L. (1984). Determinants of demand for international tourist flows to Turkey. *Tourism Management, 5*(4), 288–297.
Uysal, M., & Crompton, J. L. (1985). Deriving a relative price index for Inclusion in international tourism demand estimation models. *Journal of Travel Research, 24*(1), 32–34. https://doi.org/10.1177/004728758502400106.
Vogt, M. G. (2008). Determinants of the demand for US exports and imports of tourism. *Applied Economics, 40*(6), 667–672.
Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2 ed.). Massachusetts: MIT Press.
WTO (2018). *World trade organization statistics database.* http://stat.wto.org/StatisticalProgram/WSDBViewData.aspx?Language=E.



Dr. Tarik Dogru is an assistant professor of hospitality management in the Dedman School of Hospitality at Florida State University. He earned a bachelor's and master's degree in business administration from Zonguldak Karaelmas University and earned a doctorate degree in hospitality management from University of South Carolina. Prior to joining Florida State University, Dr. Dogru worked at Boston University as an assistant professor for two years. His research interests include hospitality finance, corporate finance, franchising, hotel investments, tourism economics, climate change, and blockchain technology.

Dr. Cem Işık is an associate professor in the Faculty of Tourism at the Anadolu University. He received his bachelor degree in economics from 9 Eylül and Master's Degree in MIS from UST/Houston/Texas. He earned a doctorate degree in economics from Atatürk University. Prior to joining Anadolu University, Dr. Işık worked at Atatürk University as an assistant professor for seven years. He teaches Tourism Economics and Innovation in Tourism. His research interests include the tourism economics, energy economics, innovation, and applied econometrics.



Dr. Ercan Sirakaya-Turk is a full professor in the College of Hospitality, Retail and Sports Management at the University of South Carolina. Dr. Sirakaya-Turk is the founding Editor-in-Chief for e-Review of Tourism Research, and the current Editor-in-Chief for Tourism Analysis. He teaches tourism, marketing, tourism economics, and advanced research methods classes, conducts grant and statistics workshops for faculty and doctoral students, provides individual consultation in research and grants. His current research interests center around destination branding, sustainability and tourism economics.